REMARKS

Claims 1-19 are pending. Claims 12-18 have been allowed. The applicants respectfully request reconsideration and allowance of this application in view of the above amendments and the following remarks.

Claims 1, 2, and 19 were rejected under 35 USC 102(e) as being anticipated by Platt. The applicants respectfully request that this rejection be withdrawn for the following reasons.

The office action asserts that Platt discloses sensing waveform generating section 22, 23 that generates an angular velocity sensing waveform based on an angular velocity oscillatory component such that first and second sensor units cause vibrators to oscillate with mutually opposite phases in a standard vibrating direction to cause sensing waveform generating sections to generate first and second angular velocity sensing waveforms 54, 56 having mutually inverted phases. The applicants disagree with the office action for the following reasons.

The proof masses 12 and 13 and sense plates 22 and 23 of Platt generate sense pick-off signals 86 and 88 corresponding to the first and second angular velocity sensing waveforms. Proof masses 12 and 13 and motor pickoff combs 20 and 21 of Platt generate motor pick-off signals 54 and 56 (see Fig. 1 and corresponding descriptions).

Platt teaches actively controlling movement within a micro-electromechanical system (MEMS) structure to reduce effects of common mode oscillations. More particularly, the proof mass 12 is located between a motor drive comb 18 and a motor pickoff comb 20, and the proof mass 13 is located between a motor drive comb 19 and a motor pickoff comb 21. The proof masses 12 and 13 each include comb-like electrodes 26 (see lines 15-19 of column 3). The

motor pickoff comb 20 include comb -like electrodes 30 extending toward the proof mass 12, and the motor pickoff comb 21 include comb-like electrodes 30 extending toward the proof mass 13 (see lines 64-67 of column 3).

In Platt, the electrodes 26 and the electrodes 30 form capacitors. The capacitors allow a MEMS gyroscope 10 to sense motion in a drive axis, or x-axis (see lines 6-10 of column 4).

Motor pick-off signals 54 and 56 are outputted from the motor pickoff combs 20 and 21, respectively, in Platt. The signal 54 is inputted to a gain stage 58, and the signal 56 is inputted to a gain stage 60, which has the same amount of gain as the gain stage 58. An output of the gain stage 58 is inputted to an inverter 64, and an output of the inverter 64 is inputted to a non-inverting input of an op-amp 70. An output of the gain stage 60 is inputted to an inverting input of the op-amp 70. The op-amp 70 amplifies a difference between the signals 54 and 56 and outputs a motor pick-off difference signal 72.

In Platt, the motor pick-off difference signal 72 represents an amplitude of common mode oscillation (see lines 13 -28 of column 5), which oscillates along the x-axis. In other words, the signal 72 represents the amplitude of motor motion, or movement of proof masses 12 and 13 along the x-axis (See lines 11-13 of column 5). The difference signal 72 is inputted into a control loop 80, and the control loop 80 produces motor drive signals 50 and 52.

In the device of Platt, the signals 50 and 52 are, respectively, outputted to the motor drive combs 19 and 18 to minimize common mode oscillations (see lines 29-36 of column 5). Therefore, because the control loop 80 adjusts the movement of each of the motor drive combs 18 and 19 along the drive axis (x-axis), common mode oscillations oscillating along the drive

axis can be minimized to correctly drive the motor drive combs 18 and 19 along the drive axis. The drive axis is different from a sense axis (y-axis), concerning an angular rate.

Further, in Platt, a sense plate 22 and the proof mass 12 form a capacitor, and a sense plate 23 and the proof mass 13 form a capacitor. If an angular rate is applied to the gyroscope 10 along an input axis (z-axis) while the proof mass 12 is oscillating along the drive axis, a Coriolis force is detected. The capacitance of the capacitors is employed in sensing motion in a sense axis (y-axis).

The gyroscope 10 outputs sense pick-off signals 86 and 88 proportional to the change in capacitance (see lines 11-21 of column 4). A difference between the signals 86 and 88 is amplified by an amplifier 90, and outputted to sense electronics 92. The sense electronics 92 outputs a signal to a control loop 80. A reference voltage 96 is inputted into the control loop 80 for automatic gain control (see lines 52-57 of column 5). Therefore, an angular rate applied to the gyroscope 10 can be detected by performing automatic gain control for a difference between the signals 86 and 88.

However, in Platt, no gain control is performed for at least one of the sense pick-off signals 86 and 88. Note that claim 1 requires the following:

> an input gain adjuster for independently and variably adjusting at least one of an input gain of said first angular velocity sensing waveform and an input gain of said second angular velocity sensing waveform entered into said differential waveform detector so as to reduce a residual in-phase component of said differential waveform

Therefore, in Platt, when common mode oscillations along the sense axis (y-axis) are included in the movement of each proof mass, an angular rate applied to the gyroscope 10 cannot correctly be detected.

In the present invention, a vibration type angular velocity sensor comprises first and second sensor units. Each sensor unit has a vibrator that oscillates in a standard vibrating direction, and a sensing waveform generating section that detects an angular velocity oscillatory component in an angular velocity sensing direction when an angular velocity is applied to the vibrator. The sensing waveform generating sections generate first and second angular velocity sensing waveforms having mutually inverted phases. An input gain adjuster adjusts at least one of input gains of the first and second angular velocity sensing waveforms to reduce an in-phase component of a differential wave form between the first and second angular velocity sensing waveforms. Accordingly, in the present invention, an in-phase component acting in the angular velocity sensing direction can be reduced when an angular velocity is applied to the vibrators.

Claims 8 and 9 were rejected under 35 USC 103(a) as being unpatentable over Platt in view of Nakamura. The applicants respectfully request that this rejection be withdrawn for the following reasons.

Claims 8 and 9 depend on claim 1. As mentioned above, the Platt reference fails to disclose or suggest the limitations of claim 1. The patent to Nakamura fails to supply what is missing in the Platt patent. That is, Nakamura fails to disclose or suggest an input gain adjuster adjusts at least one of input gains of the first and second angular velocity sensing waveforms to reduce an in-phase component of a differential wave form between the first and second angular velocity sensing waveforms. Therefore, even if the disclosure of Nakamura is combined with the

disclosure of Platt, the terms of claims 1, 8 and 9 would not be satisfied, and this rejection should be withdrawn.

In view of the foregoing, the applicants respectfully submit that this application is in condition for allowance. A timely notice to that effect is respectfully requested. If questions relating to patentability remain, the examiner is invited to contact the undersigned by telephone.

Please charge any unforeseen fees that may be due to Deposit Account No. 50-1147.

Respectfully submitted,

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